Appendix B: Maui Long Range Land Transportation Plan

EXECUTIVE SUMMARY

MAUI LONG-RANGE LAND TRANSPORTATION PLAN

April, 1997

Prepared for:

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION

In Cooperation with:

COUNTY OF MAUI DEPARTMENT OF PUBLIC WORKS
COUNTY OF MAUI PLANNING DEPARTMENT

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The Plan also contains a financial element that identifies both current and potential future sources of revenue that may be available for the implementation of this plan. The financial element of the plan illustrates the relationship of these revenue projections with the estimates of costs associated with the implementation and operation of each of the transportation plans and programs contained in the plan.

The 1991 Inter-modal Surface Transportation Efficiency Act (ISTEA) establishes new transportation planning requirements for state and local jurisdictions. In order to be eligible for federal transportation funds, states must comply with the new federal provisions. The County of Maui Long-Range Land Transportation Plan, which serves to update and augment the previous plan, must be responsive to all applicable requirements of ISTEA. ISTEA requires that the State of Hawaii DOT, in cooperation with its participating agencies, develop a long-range plan that is updated at least every five years. The STP must be directed at a time horizon of at least 20 years and contain a priority list of projects. It must also be fiscally constrained, including a financial plan indicating the resources reasonably expected to be available to fund the 20+ year transportation plan. The financial component is an ISTEA requirement. The plan must also have input from public officials and citizens.

STUDY PROCESS

The County of Maui Long-Range Land Transportation Plan was prepared through a study process that included extensive research and analysis by the staffs of HDOT and the Planning and Public Works Departments of the County of Maui, and input from the CAC and the consultant. The agencies' staffs provided background data and technical guidance and served as a sounding board for potential proposals and solutions. Five key elements of the study process include roadside origin/destination survey, the travel demand forecasting methodology and procedures, alternatives evaluation, funding evaluation, and the public participation program.

Roadside Origin/Destination Survey

An origin/destination roadside vehicle survey was conducted as part of this study in June, 1994 to develop information related to travel characteristics and behavior of motorists on Maui. This

survey was conducted by establishing series of stations at key locations throughout the Island. These stations were placed at the following 6 locations:

- Kaahumanu Avenue west of South Papa Avenue
- Hana Highway at Baldwin Park
- Haleakala Highway south of Hana Highway
- Kuihelani Highway north of Honoapiilani Highway
- Mokulele Highway south of Animal Shelter
- North Kihei Road near Kealia Pond

Motorists were selected at random and directed to pull off the road and were asked if they would be willing to submit to a survey which would take a minute or two. The survey questionnaire was designed to determine the time of the survey and the number of occupants (both of which were determined by the surveyor by observation), and several questions related to the motorist's trip. These included whether the motorist was a resident of Maui or not, the purpose of this particular trip, the origin and destination of the trip, the frequency with which the motorist makes this trip, and whether or not this same trip would be repeated in the afternoon in reverse (the motorist was asked if the trip was made earlier in the day if the survey was conducted during afternoon hours).

The survey results were used to develop information on trip generation by trip purpose, trip distribution, and time of day facts related to travel. All were relevant input into the development of the travel demand forecasting model.

Travel Demand Forecasting

The travel demand forecasting model developed for this study effort was adapted for use on the microcomputer-based software package TRANPLAN. A roadside origin/destination survey was conducted to obtain information to be used in the development of trip generation factors and trip distribution patterns. Using socioeconomic data from the County Planning Department, the TRANPLAN-based model was used to complete the 3-step process incorporated for this travel model: trip generation, trip distribution, and network assignment. Similar to previous efforts, the travel demand forecasting model for the Island of Maui did not attempt to calculate the magnitude of the person trip generation and then estimate the percentage of person trips made by transit or non-vehicular modes. The methodology used for this model developed vehicle trip estimates

Public Participation Program

The public involvement program is an integral part of the overall planning process used in the development of the County of Maui Long-Range Land Transportation Plan. The public's input and participation were sought and incorporated at each stage of the study process, from confirmation of the work program, assessment of existing conditions, to the evaluation of future conditions and identification of potential deficiencies, and the development and evaluation of the alternative improvements and strategies. Public input was also used to refine and finalize the Transportation Plan that is the primary subject of this document. The public outreach program was accomplished through the use of public information meetings designed specifically to discuss the plan.

SUMMARY OF PLAN

The 2020 County of Maui Long-Range Land Transportation Plan consists of two elements, the Highway Element and the Bikeway Element. The highway element consists of major highway improvements (i.e., roadway widenings and construction of new facilities), as well as transportation system management (TSM) measures such as operational and safety improvements. The bikeway element includes all elements of the Statewide Bikeway Plan which are relevant to Maui County. Although the transit program is normally one of the elements of this plan, the transit system does not have any improvement plans available for inclusion in this plan. The plan has been developed in three time periods, 1996-2000, 2001-2005, and 2006-2020 in accordance with available funding for projects in each time period.

Tables 1, 2 and 3 summarize the plan identifying the projects and programs by time period. The projects proposed for the time period between 1996 and Year 2000 are listed in Table 1 and illustrated in Figure 1. As indicated in Table 1, projects in this first time-frame include the widening of Honoapiilani Highway in the Kaanapali area, the construction of the new four-lane airport access road using the Kuihelani Highway alignment to bypass Diary Road, the widening of portions of Puunene Avenue, Kuihelani Highway and Mokulele Highway from two to four lanes. Included as part of the improvement program for this period are funds to conduct feasibility studies and alternatives analyses for the Alternate Highway in Paia and the extension of the widening of Hana Highway, Honoapiilani Highway, Kuihelani Highway and Mokulele Highway.

Projects recommended for the 2001 to 2005 time-frame are listed in Table 2 and illustrated in Figure 2. Significant projects proposed in this period include the North/South Collector Road through Kihei, the construction of a portion of the Lahaina Bypass, the extension of the widening of Mokulele Highway, and the Alternate Highway in Paia. Projects proposed for the 15-year time period between 2006 and 2020 are listed in Table 3 and illustrated in Figure 3. Significant projects recommended for this time period include the completion of and widening of existing segments of the Lahaina Bypass, the Maui Lani Parkway, the Puunene Bypass, widening of portions of the Honoapiilani Highway, and the extension of the widening of Kuihelani Highway.

Short-Range Improvement Program for Kihei

A supplemental element of the study was the development of a short-range highway master plan for the Kihei area of the island. This element of the study was directed at the identification of the improvements proposed for the Kihei Community which should be implemented within a 10-year time-frame before Year 2005. Two key criteria used to select the short-range improvements for Kihei were: (1) the Year 2005 improvements would be consistent with the County of Maui Long-Range (Year 2020) Transportation Plan and (2) the improvements would be responsive to the short-range needs of the community. In order to ensure that the improvements selected for implementation by Year 2005 were reflective of these short-range needs, it was necessary to develop traffic forecasts which represented this time-frame. Rather than using the long-range 2020 forecasts and extrapolating back to 2005, it was determined that reliable forecasts for the short-range time period were best developed using existing traffic count data and forecasting upward. Morning and evening peak hour turning movement traffic counts were conducted at 19 intersections within Kihei in November, 1994. These counts served as the base condition for Kihei. Growth factors reflecting the islandwide growth and development were developed for the 11-year period from 1994 to 2005 using the long-range travel forecasting model. These factors were applied to the existing traffic volumes to estimate the effects of islandwide growth on traffic volumes in Kihei. Development projects expected to be completed within Kihei by 2005 were also identified and used to estimate the effect of future growth in local traffic on the traffic volumes. The combination of these two effects were used to develop Year 2005 traffic forecasts for Kihei. These forecasts were used to identify short-range needs and deficiencies. Table 4 summarizes the elements of the short-range improvement program for Kihei. The location of the improvements are schematically illustrated in Figures 4 and 5.

The most significant projects proposed for completion by 2005 in Kihei include the following in relative order of importance to the plan:

- Reconfiguration of the Mokulele Highway/Piilani Highway intersection in Kihei
- Completion of the North/South Collector Road through Kihei
- Signalization of 14 intersections on South Kihei Road and Piilani Highway

Other improvements proposed for completion by 2005 include the widening of the intersection approaches on Piilani Highway, the widening of South Kihei Road near Lipoa Street, and the completion of Road C and Road F in Kihei.

FINANCIAL PLAN

The financial plan is summarized in Table 5. As indicated in the table, costs and revenues have been estimated for each of the three time periods, as well as for the entire plan period. Overall costs to implement the County of Maui Long-Range Land Transportation Plan are estimated to be approximately $1.8 billion in escalated future year-of-expenditure dollars over the entire 25-year plan period. Overall projected revenues slightly exceed the estimated costs, resulting in slight surpluses for two of the three plan periods. The revenue forecasts include continuation of traditional federal, state, and city and county funding sources, plus projected developer contributions for those projects which have been assumed to be the responsibility of respective developers in each area.

All the projects on the priority lists have been included in one of the periods. It should be noted however, that portions of one project, the Honoapiilani Highway widening (#S19), could not be implemented within the projected budget. The portions of Honoapiilani Highway improvement which could not be implemented consists of an estimated four mile stretch west of the Maalaea Harbor and the segment from North Kihei Road to Maalaea Harbor. It should be noted that these segments are still part of the plan and could be implemented if funding became available or they moved up in priority.

Therefore, given the projected revenues and costs, the proposed Maui Long-Range Transportation Plan could be implemented, with the exception of a portion of Honoapiilani Highway, by the year 2020.

IMPLEMENTATION OF PLAN

The next steps involve the submission of the County of Maui Long-Range Land Transportation Plan to the State of Hawaii so that it can be integrated into the Statewide Transportation Plan. Additional issues to which attention must be given include consideration of projects that may require major investment studies (MIS), coordination with National Environmental Policy Act (NEPA) and Section 404 of the Clean Water Act procedures, and additional activities required by the various relevant agencies.

TABLE 1
COUNTY OF MAUI LONG RANGE LAND TRANSPORTATION PLAN
HIGHWAY IMPROVEMENTS - PERIOD 1996-2000

No.	Facility	Location	Description	Estimated Cost [a]
PERIOD 1996-2000				
S4	Honoapiilani Highway*	In Kaanapali, from Kaanapali Parkway to Lower Honoapiilani Road	Widen from two to four lanes	$9.8 [b]
S1	Kahului Beach Road*	In Wailuku, from Waiehu Beach Road to Kaahumanu Avenue	Widen from two to four lanes with separate left-turn lanes at major intersections	$5.2m
S2	Dairy Road*	In Kahului, from Hukilike Street to Haleakala Highway/Keolani Place	Widen from two to four lanes with separate left-turn lanes from Haleakala Highway to Hana Highway. Five lanes (four through with two-way center turn lane) from Hana Highway to Hukilike Street.	$3.8 [b]
C5	Road F*	In Kihei, from S. Kihei Road to Piilani Highway	New four lane connector road	$3.5 [b]
C1	Lower Main Street*	In Wailuku, from Kahului Beach Road/Waiehu Beach Road to Hala Place	Widen from two to four lanes with separate left-turn lanes at major intersections	$2.7m
S13a	Kuihelani Highway	In Central Maui, from Puunene Avenue southerly for 1.4 miles (point where Puunene Bypass will intersect)	Widen from two to four lanes	$4.8m
S5	Kuihelani Highway*	In Kahului, from Puunene Avenue to Kahului Airport	New four lane access road to Kahului Airport to provide bypass to Dairy Road	$50.0m
S20a	Puunene Avenue	In Kahului, from Kaahumanu Avenue to Wakea Avenue	Widen from two to four lanes	$1.8 [b]
S20c	Puunene Avenue	In Kahului, from Kuihelani Highway to Mokulele Highway	Widen from two to four lanes	$2.1 [b]
S21a	Hana Highway	In Kahului, from Kaahumanu Avenue to Dairy Road	Widen from four to six lanes from Kaahumanu Avenue to Dairy Road	$2.9m
S14a	Mokulele Highway	In Central Maui, from Puunene Avenue southerly for 1.2 miles (point where Puunene Bypass will intersect)	Widen from two to four lanes	$4.3m
S19a	Honoapiilani Highway	In Central and West Maui, from Kuihelani Highway to N. Kihei Road	Widen from two to four lanes	$10.4m
C3	Road C	In Kihei, from Kihei Road (at Longs/Azeka commercial area) to Piilani Highway	New four lane connector road	$6.1 [b]
S15	Haleakala Highway	In Upcountry area, from Hana Highway to Haliimaile Road	Widen from three to four lanes	$19.1m
	Assessment Studies	Islandwide	Conduct assessment studies for the Paia Alternative Roadway, Hana Highway Widening, Kuihelani Highway Widening, Mokulele Highway Widening, and Honoapiilani Highway Widening	$2.2m

Notes: * Denotes Baseline project.
a. All cost estimates are in millions of 1995 dollars and include design and construction.
b. Cost to be the full or partial responsibility of private developers.

TABLE 2
COUNTY OF MAUI LONG RANGE LAND TRANSPORTATION PLAN
HIGHWAY IMPROVEMENTS - PERIOD 2001-2005

No.	Facility	Location	Description	Estimated Cost [a]
PERIOD 2001-2005				
S3a	Lahaina Bypass*	In Lahaina, from southern terminus to Dickenson Street	Two-lane roadway with access to Honoapiilani Highway at Dickenson Street.	$17.0m
C2	Waiale Road Extension*	In Wailuku, from Waiale Road through Maui Community Corrections Center to Honoapiilani Highway	Two lane roadway to provide access between Waiale Road and Honoapiilani Highway	$3.0 [b]
C6	North/South Collector Road	In Kihei, from Uwapo Road to Road F	New two lane collector road in north south direction	$23.1 [b]
S23	Mokulele/Piilani Highway Intersection	In Kihei, at intersection of Mokulele and Piilani Highways	Reconfigure intersection making the Mokulele to Piilani move the through movement	$10.8m
C4	S. Kihei Road	In Kihei, from Longs to Lipoa Street	Widen roadway from two to four lanes with continuous left turn lane	$0.9m
C13	S. Kihei Road	In Kihei, from Kupuna Street to Welakahao Road	Widen roadway from two to four lanes	$0.9m
S14b	Mokulele Highway	In Central Maui, from a point 1.2 miles south of Puunene Avenue to N. Kihei Road	Widen from two to four lanes	$17.3m
S18	Paia Alternative Roadway	In Paia, from Spreckelsville to Hookipa Park	New two lane roadway to bypass town of Paia	$17.5m
C7	Lower Main Street	In Kahului, from Waena Street to Mill Street	Widen from two to four lanes and provide separate left-turn lanes at major intersections	$1.8m

Note: * Denotes Baseline project.
a. All cost estimates are in millions of 1995 dollars and include design and construction.
b. Cost to be the full or partial responsibility of private developers.

TABLE 3
COUNTY OF MAUI LONG RANGE LAND TRANSPORTATION PLAN
HIGHWAY IMPROVEMENTS - PERIOD 2006-2020

No.	Facility	Location	Description	Estimated Cost [a]
PERIOD 2006-2020				
S13b	Kuihelani Highway	In Central Maui, from a point 1.4 miles south of Puunene Avenue to Honoapiilani Highway	Widen from two to four lanes	$14.6m
S3b	Lahaina Bypass*	In Lahaina/Kaanapali, from Dickenson Street to northern terminus	Two-lane roadway with access to Honoapiilani Highway at Kapunakea Street, Lealii Parkway, Wahikuli Connector, Kaanapali Connector, and Puukolii Connector	$52.0m
S12	Lahaina Bypass	In Lahaina/Kaanapali, from Kaanapali to Dickenson Street	Widen from two to four lanes	$11.0m
C8a	Maui Lani Parkway	In Wailuku, from Kaahumanu Avenue to Kuihelani Highway	New two lane road	$21.1 [b]
C8b	Oneehee Avenue Extension	In Wailuku, from southern terminus to Maui Lani Parkway	Extension of two lane road	$5.1 [b]
C8c	Kamehameha Avenue Extension	In Wailuku, from southern terminus to Maui Lani Parkway	Extension of two lane road	$4.1 [b]
C8d	Lono Avenue Extension	In Wailuku, from southern terminus to Kuihelani Highway	Extension of two lane road	$2.0 [b]
C8e	Mahalani Street Extension	In Wailuku, from southern terminus to Waiale Road	Extension of two lane road	$8.3m
S20b	Puunene Avenue	In Kahului, from Wakea Avenue to Kuihelani Highway	Widen from two to four lanes	$2.4 [b]
C12	Puunene Bypass	In Wailuku, from Mokulele Highway to Kuihelani Highway	Two lane Puunene Bypass road that connects to Maui Lani Parkway	$11.5 [b]
S21b	Hana Highway	In Kahului, from Dairy Road to Baldwin Avenue	Widen from four to six lanes from Dairy Road to Haleakala Highway, and from two to four lanes from Haleakala Highway to Baldwin Avenue	$21.6m
S6	Piilani Highway	In Kihei, from Mokulele Highway to Wailea	Widen from two to four lanes	$21.6m
S17	Upcountry-Kihei Alternative Roadway	In Upcountry, from Haleakala Highway to Piilani Highway	New two lane roadway to serve as bypass of Mokulele Highway	$57.5m
C10	Papa Avenue	In Wailuku, from Kaahumanu Avenue to Kahului Beach Road	Four lane extension of Papa Avenue	$5.1m
S19d	Honoapiilani Highway	In West Maui, 4 miles west of Maalaea Harbor to Lahaina Bypass	Widen from two to four lanes	$87.2m

TABLE 3 (Continued)
COUNTY OF MAUI LONG RANGE LAND TRANSPORTATION PLAN
HIGHWAY IMPROVEMENTS - PERIOD 2006-2020

No.	Facility	Location	Description	Estimated Cost [a]
PERIOD 2006-2020 (Continued)				
C11	Waiale Drive [C Brewers]	In Wailuku, from Kaahumanu Avenue to Honoapiilani Highway	Extend Waiale Drive as a four lane roadway from its curve to Honoapiilani Highway; widen Waiale Drive from Kaahumanu Avenue underpass to Spreckels Ditch; extend Waiale Road to Maui Tropical Plantation as two lane bypass road of Waikapu Village	$18.6 [b]
C9	Imi Kala Street [C Brewers]	In Wailuku, from Kahekili Highway to L. Main Street	Extend Imi Kala Street from Millyard Subdivision to Kahekili Highway as four lane roadway with a four lane bridge over Iao Stream, extend Piihana Road from Imi Kala Street extension to Market Street, extend Imi Kala Street as two lane roadway from Mill Street to L. Main Street and from Millyard Subdivision into Piihana Project District	$6.4 [b]
S10	Kahekili Highway	In Wailuku, from Waiehu Beach Road to Waihee Valley Road	Widen from two to four lanes	$8.3m
S16	Pukalani Bypass	In Pukalani, from Haliimaile Road to Kula Highway	Widen from three to four lanes	$5.1m
S22	Kula Highway	In Kula, from Pulehu to Kula Junction	Widen from two to four lanes	$13.0m
S11	Waiehu Beach Road	In Wailuku, from Kahului Beach Road to Kahekili Highway	Widen from two to four lanes	$5.4m

Notes:
* Denotes Baseline project.
a. All cost estimates are in millions of 1995 dollars and include design and construction.
b. Cost to be the full or partial responsibility of private developers.

TABLE 4
KIHEI TRAFFIC MASTER PLAN
YEAR 2005 IMPROVEMENTS

Map #	Improvement
1.	Mokulele Highway/Piilani Highway Intersection - Reconfigure intersection to create Mokulele to Piilani as through movement.
2.	Piilani Highway - Widen to Four lanes from reconfigured Mokulele Highway intersection to Uwapo Road. Also, widen to four lanes at signalized intersections.
3.	North/South Collector - Construct new two lane north/south collector between Uwapo Road and Kanani Road and between Road "F" and Kilohana Drive. Between Waipulani Road and Lipoa Street four lane may need to be provided. Existing streets (i.e., Kenolio Road and collector road south of Welakahao Road) would be incorporated as part of the North/South Collector.
4.	South Kihei Road - Widen to five lanes between Longs and Lipoa Street. This improvement would result in four travel lanes with a continuous left-turn lane.
5.	Road "C" - Construct new four lane road between South Kihei Road and Piilani Highway. This road would provide access to the Longs/Azeka commercial area.
6.	Road "A" - Construct new two lane road between Road "B" and Lipoa Street which provides access to commercial area.
7.	Road "B" - Construct new two lane road between South Kihei Road and North/South Collector which provides access to abutting properties.
8.	Road "F" - Construct new two lane road between South Kihei Road and Piilani Highway.
	Provide traffic signals along South Kihei Road at: • Uwapo Road • Ohukai Road • Kaonoulu Street • Kulanihakoi Road • Road "C" - with this new signal, the existing signals at the McDonald's and Azeka Place driveways could be removed. • Welakahao Road • Kanani Road • Road "F" • Keonekai Road Provide traffic signal at Piilani Highway and North Kihei Road
	Provide traffic signals along Piilani Highway at: • Kaonoulu Street • Waipuilani Road • Welakahao Road • Road "F" • Kilohana Drive
	At all non-signalized locations along Piilani Highway allow right-turn in/out only.

TABLE 5
ESTIMATED REVENUE AND COST SUMMARY
(Millions of Year-of-Expenditure Dollars)

HIGHWAY ELEMENT

	1996-2000	2001-2005	2006-2020	Total
REVENUES				
Federal [a]	$73.4	$85.8	$347.5	$506.7
State M&O Revenues	$67.5	$71.7	$256.3	$395.5
State Capital Revenues	$18.2	$13.1	$72.7	$104.0
County Highway Revenues [b]	$81.8	$107.1	$572.6	$761.5
Developer Funding [c]	$11.7	$0.0	$103.2	$114.9
Total Revenues	$252.6	$277.7	$1,352.3	$1,882.6
COSTS				
Highway Element M&O Costs	$119.7	$151.6	$671.1	$942.4
Highway Element Capital Costs	$132.9	$124.1	$675.4	$932.4
Total Costs	$252.6	$275.7	$1,346.5	$1,874.8
BALANCE	$0.0	$2.0	$5.8	$7.8

Notes:

[a] Maui's share of statewide federal allocation assumed at 12%.
[b] Includes both Highway Fund & General Fund revenues.
[c] Assumes developer funding for selected projects.